FIG. 1

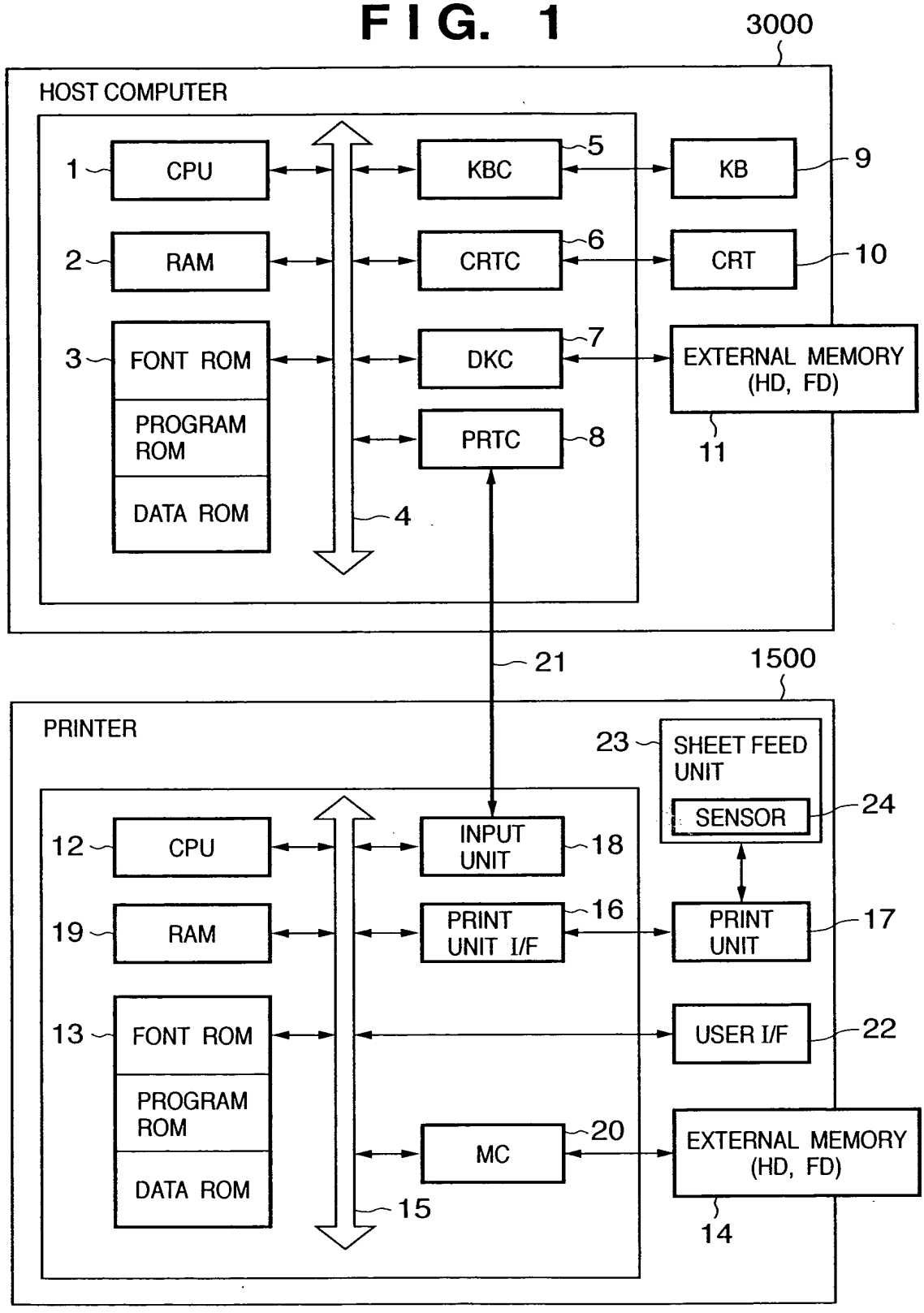

3000
HOST COMPUTER
1
CPU
2
RAM
3
FONT ROM
PROGRAM ROM
DATA ROM
4
KBC
5
CRTC
6
DKC
7
PRTC
8
KB
9
CRT
10
EXTERNAL MEMORY (HD, FD)
11
21
1500
PRINTER
12
CPU
19
RAM
13
FONT ROM
PROGRAM ROM
DATA ROM
15
INPUT UNIT
18
PRINT UNIT I/F
16
MC
20
23
SHEET FEED UNIT
SENSOR
24
PRINT UNIT
17
USER I/F
22
EXTERNAL MEMORY (HD, FD)
14

FIG. 2

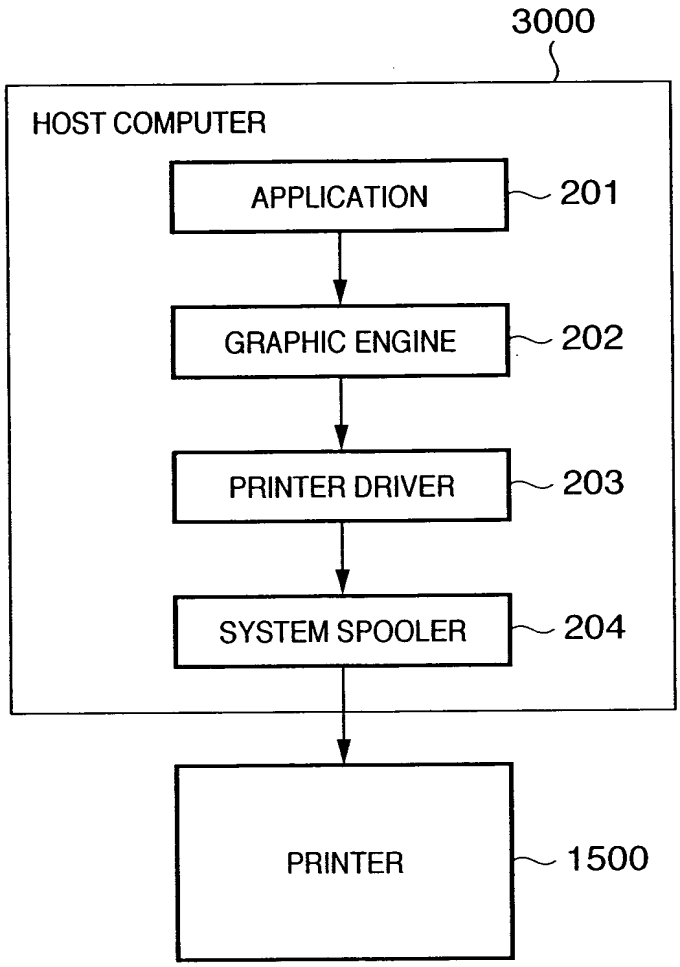

3000
HOST COMPUTER
APPLICATION
201
GRAPHIC ENGINE
202
PRINTER DRIVER
203
SYSTEM SPOOLER
204
PRINTER
1500

FIG. 3

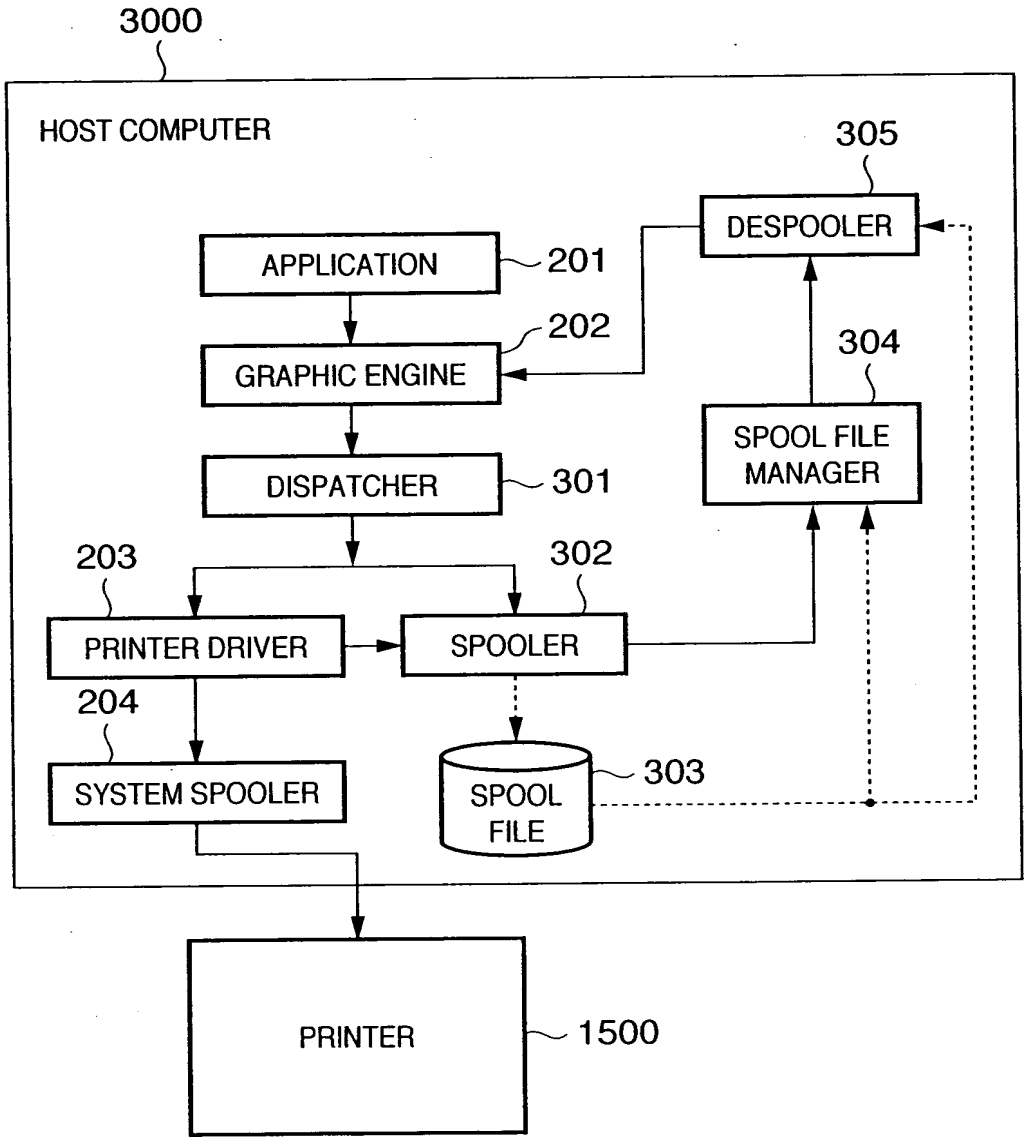

3000
HOST COMPUTER
305
DESPOOLER
APPLICATION
201
202
GRAPHIC ENGINE
304
SPOOL FILE MANAGER
DISPATCHER
301
203
302
PRINTER DRIVER
SPOOLER
204
SYSTEM SPOOLER
SPOOL FILE
303
PRINTER
1500

FIG. 4A

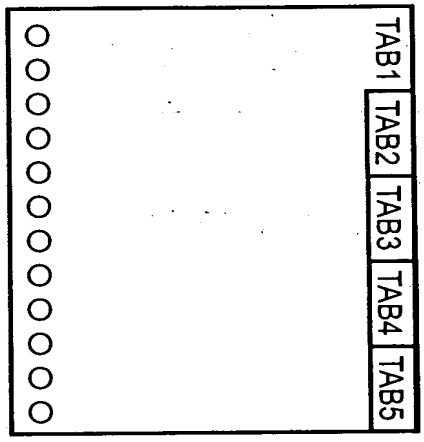


FIG. 4B

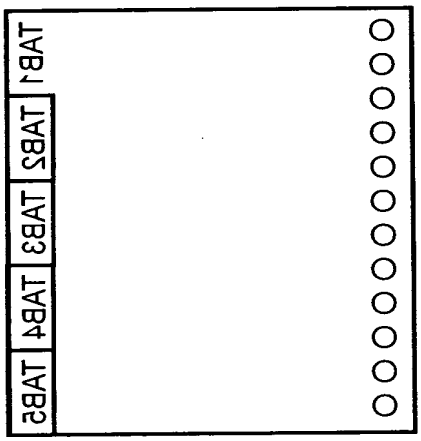


FIG. 4C

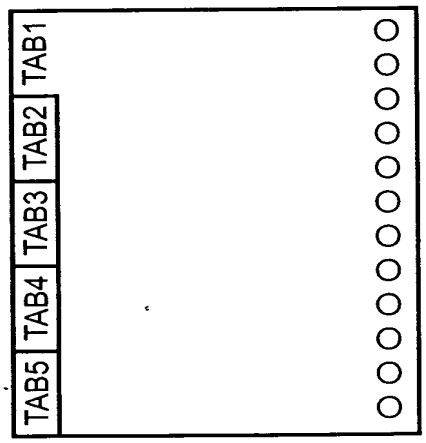


FIG. 5

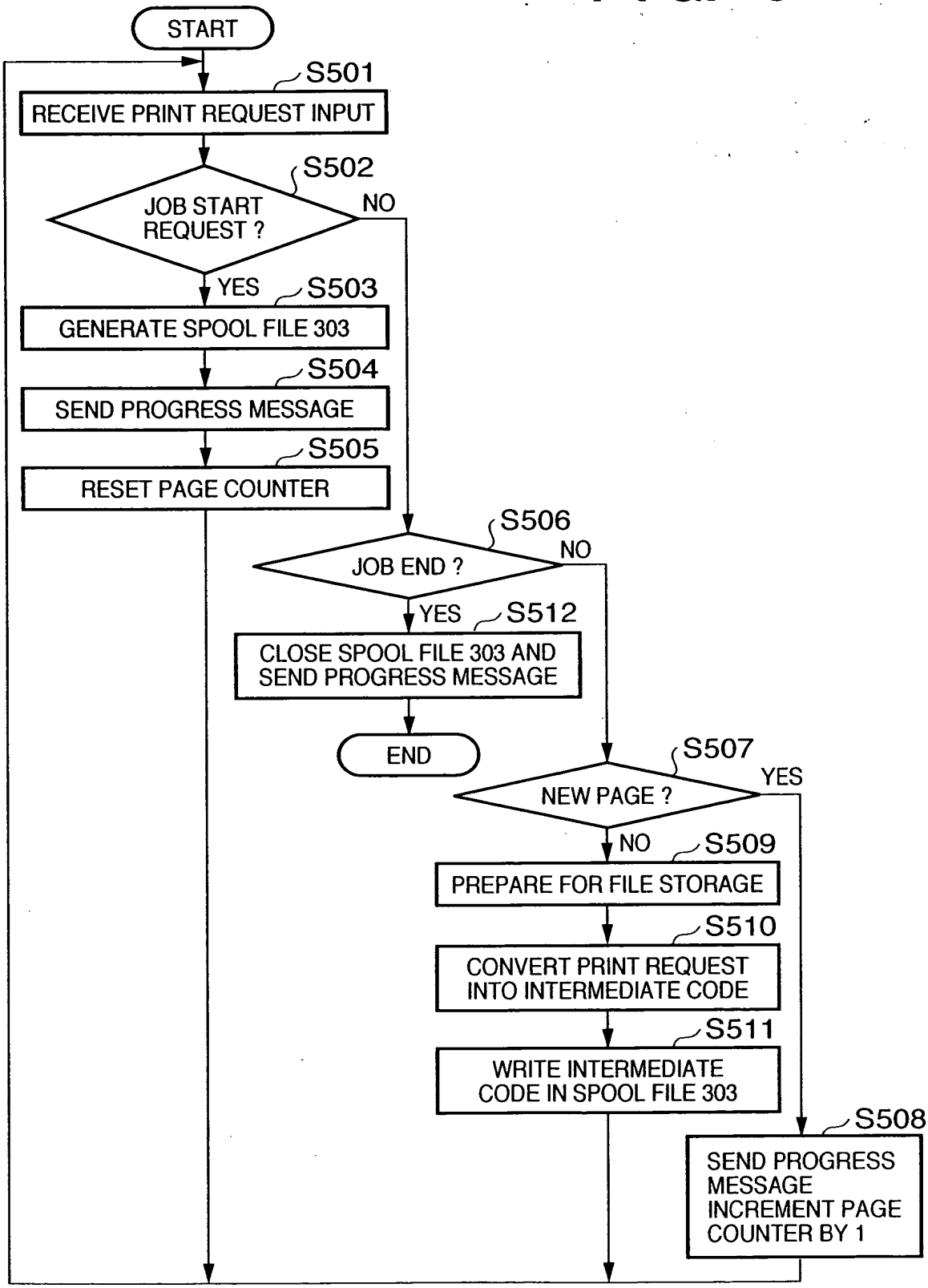

START
S501
RECEIVE PRINT REQUEST INPUT
S502
JOB START REQUEST ?
NO
YES
S503
GENERATE SPOOL FILE 303
S504
SEND PROGRESS MESSAGE
S505
RESET PAGE COUNTER
S506
JOB END ?
NO
YES
S512
CLOSE SPOOL FILE 303 AND SEND PROGRESS MESSAGE
END
S507
NEW PAGE ?
YES
NO
S509
PREPARE FOR FILE STORAGE
S510
CONVERT PRINT REQUEST INTO INTERMEDIATE CODE
S511
WRITE INTERMEDIATE CODE IN SPOOL FILE 303
S508
SEND PROGRESS MESSAGE INCREMENT PAGE COUNTER BY 1

FIG. 6

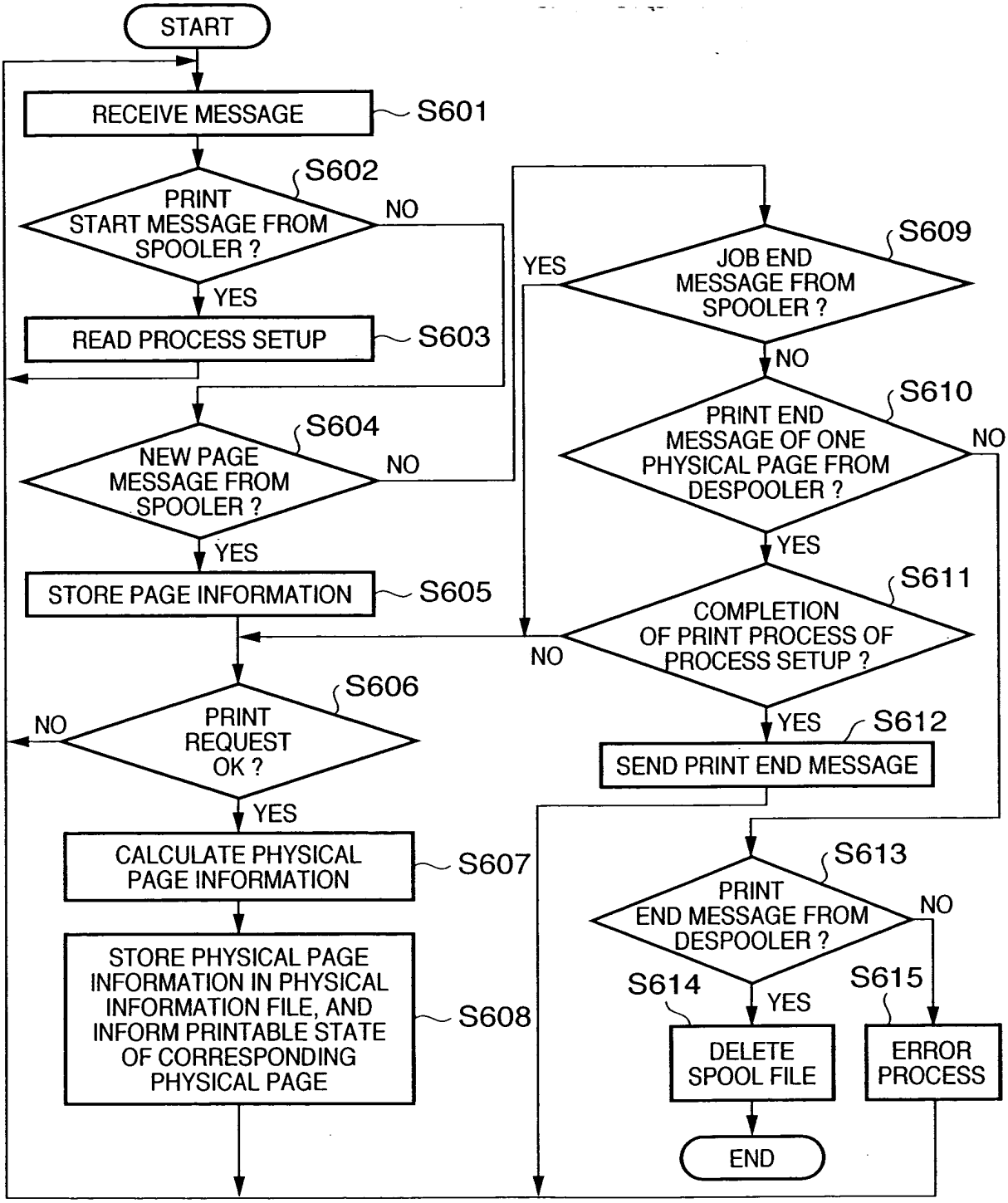

START
RECEIVE MESSAGE
S601
S602
PRINT START MESSAGE FROM SPOOLER ?
NO
YES
READ PROCESS SETUP
S603
S604
NEW PAGE MESSAGE FROM SPOOLER ?
NO
YES
STORE PAGE INFORMATION
S605
S606
PRINT REQUEST OK ?
NO
YES
CALCULATE PHYSICAL PAGE INFORMATION
S607
STORE PHYSICAL PAGE INFORMATION IN PHYSICAL INFORMATION FILE, AND INFORM PRINTABLE STATE OF CORRESPONDING PHYSICAL PAGE
S608
S609
JOB END MESSAGE FROM SPOOLER ?
YES
NO
S610
PRINT END MESSAGE OF ONE PHYSICAL PAGE FROM DESPOOLER ?
NO
YES
S611
COMPLETION OF PRINT PROCESS OF PROCESS SETUP ?
NO
YES
S612
SEND PRINT END MESSAGE
S613
PRINT END MESSAGE FROM DESPOOLER ?
NO
S614
YES
S615
DELETE SPOOL FILE
ERROR PROCESS
END

FIG. 7

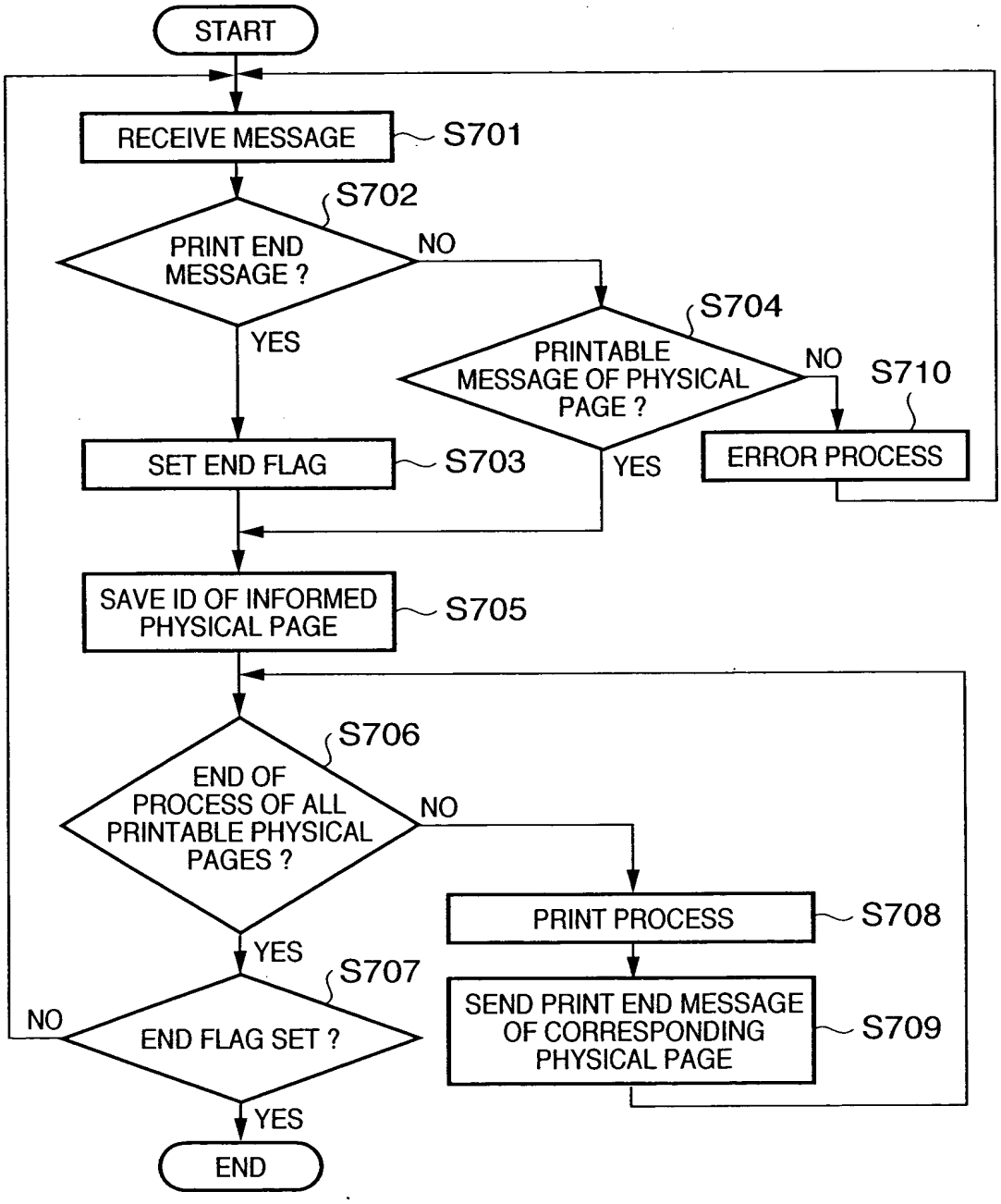

START
RECEIVE MESSAGE
S701
S702
PRINT END MESSAGE ?
NO
YES
S704
PRINTABLE MESSAGE OF PHYSICAL PAGE ?
NO
S710
ERROR PROCESS
YES
SET END FLAG
S703
SAVE ID OF INFORMED PHYSICAL PAGE
S705
S706
END OF PROCESS OF ALL PRINTABLE PHYSICAL PAGES ?
NO
YES
PRINT PROCESS
S708
S707
END FLAG SET ?
NO
SEND PRINT END MESSAGE OF CORRESPONDING PHYSICAL PAGE
S709
YES
END

FIG. 8

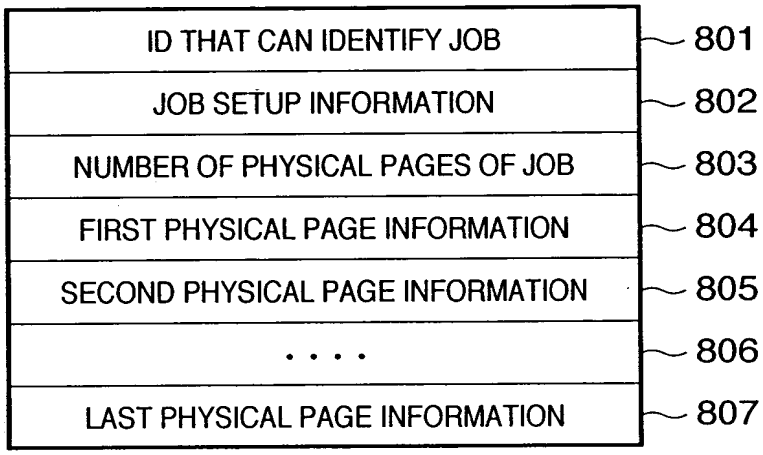

ID THAT CAN IDENTIFY JOB
801
JOB SETUP INFORMATION
802
NUMBER OF PHYSICAL PAGES OF JOB
803
FIRST PHYSICAL PAGE INFORMATION
804
SECOND PHYSICAL PAGE INFORMATION
805
. . . .
806
LAST PHYSICAL PAGE INFORMATION
807

FIG. 9

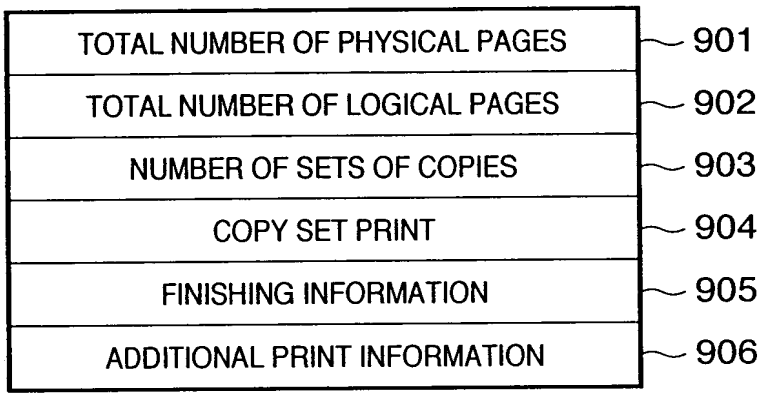

TOTAL NUMBER OF PHYSICAL PAGES
901
TOTAL NUMBER OF LOGICAL PAGES
902
NUMBER OF SETS OF COPIES
903
COPY SET PRINT
904
FINISHING INFORMATION
905
ADDITIONAL PRINT INFORMATION
906

FIG. 10

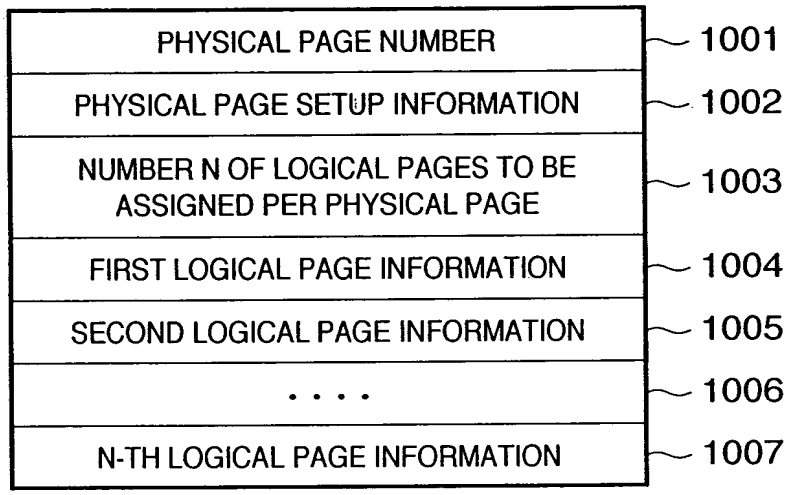

PHYSICAL PAGE NUMBER
1001
PHYSICAL PAGE SETUP INFORMATION
1002
NUMBER N OF LOGICAL PAGES TO BE ASSIGNED PER PHYSICAL PAGE
1003
FIRST LOGICAL PAGE INFORMATION
1004
SECOND LOGICAL PAGE INFORMATION
1005
. . . .
1006
N-TH LOGICAL PAGE INFORMATION
1007

FIG. 11

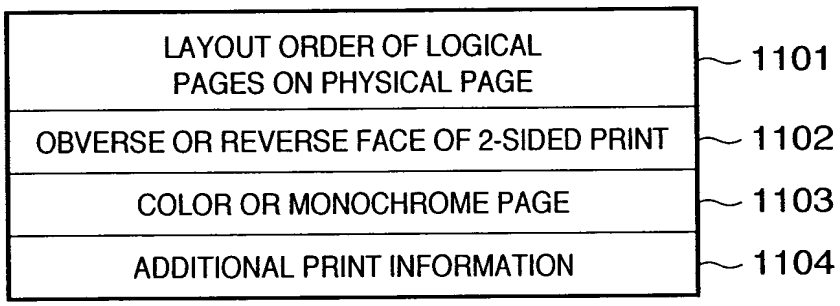

LAYOUT ORDER OF LOGICAL PAGES ON PHYSICAL PAGE
1101
OBVERSE OR REVERSE FACE OF 2-SIDED PRINT
1102
COLOR OR MONOCHROME PAGE
1103
ADDITIONAL PRINT INFORMATION
1104

FIG. 12

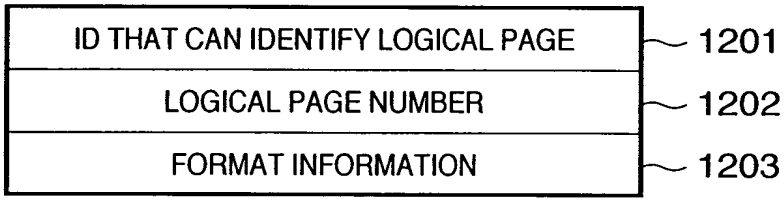

ID THAT CAN IDENTIFY LOGICAL PAGE
1201
LOGICAL PAGE NUMBER
1202
FORMAT INFORMATION
1203

FIG. 13

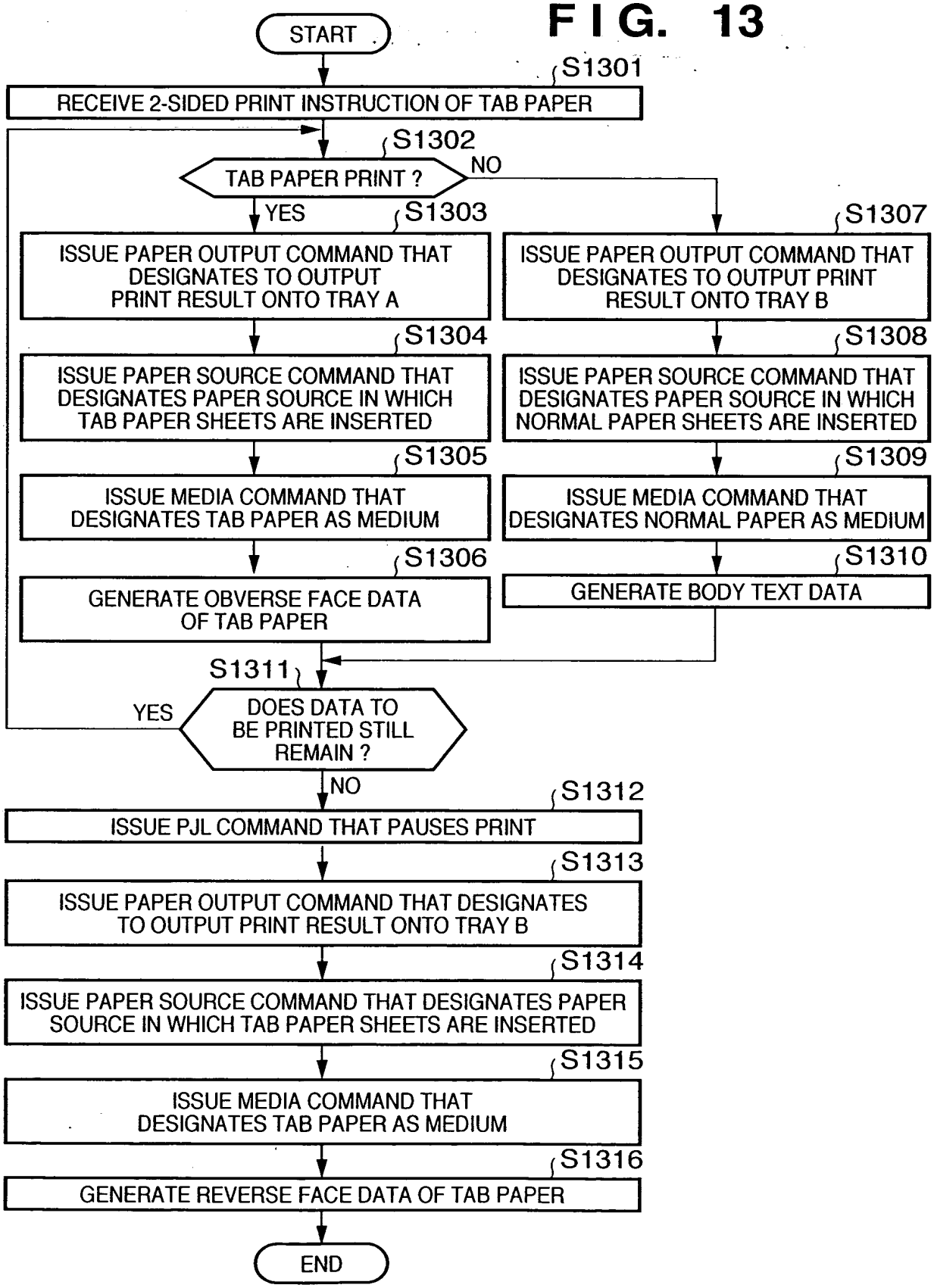

START
S1301
RECEIVE 2-SIDED PRINT INSTRUCTION OF TAB PAPER
S1302
TAB PAPER PRINT ?
NO
YES
S1303
ISSUE PAPER OUTPUT COMMAND THAT DESIGNATES TO OUTPUT PRINT RESULT ONTO TRAY A
S1304
ISSUE PAPER SOURCE COMMAND THAT DESIGNATES PAPER SOURCE IN WHICH TAB PAPER SHEETS ARE INSERTED
S1305
ISSUE MEDIA COMMAND THAT DESIGNATES TAB PAPER AS MEDIUM
S1306
GENERATE OBVERSE FACE DATA OF TAB PAPER
S1307
ISSUE PAPER OUTPUT COMMAND THAT DESIGNATES TO OUTPUT PRINT RESULT ONTO TRAY B
S1308
ISSUE PAPER SOURCE COMMAND THAT DESIGNATES PAPER SOURCE IN WHICH NORMAL PAPER SHEETS ARE INSERTED
S1309
ISSUE MEDIA COMMAND THAT DESIGNATES NORMAL PAPER AS MEDIUM
S1310
GENERATE BODY TEXT DATA
S1311
YES
DOES DATA TO BE PRINTED STILL REMAIN ?
NO
S1312
ISSUE PJL COMMAND THAT PAUSES PRINT
S1313
ISSUE PAPER OUTPUT COMMAND THAT DESIGNATES TO OUTPUT PRINT RESULT ONTO TRAY B
S1314
ISSUE PAPER SOURCE COMMAND THAT DESIGNATES PAPER SOURCE IN WHICH TAB PAPER SHEETS ARE INSERTED
S1315
ISSUE MEDIA COMMAND THAT DESIGNATES TAB PAPER AS MEDIUM
S1316
GENERATE REVERSE FACE DATA OF TAB PAPER
END

FIG. 14

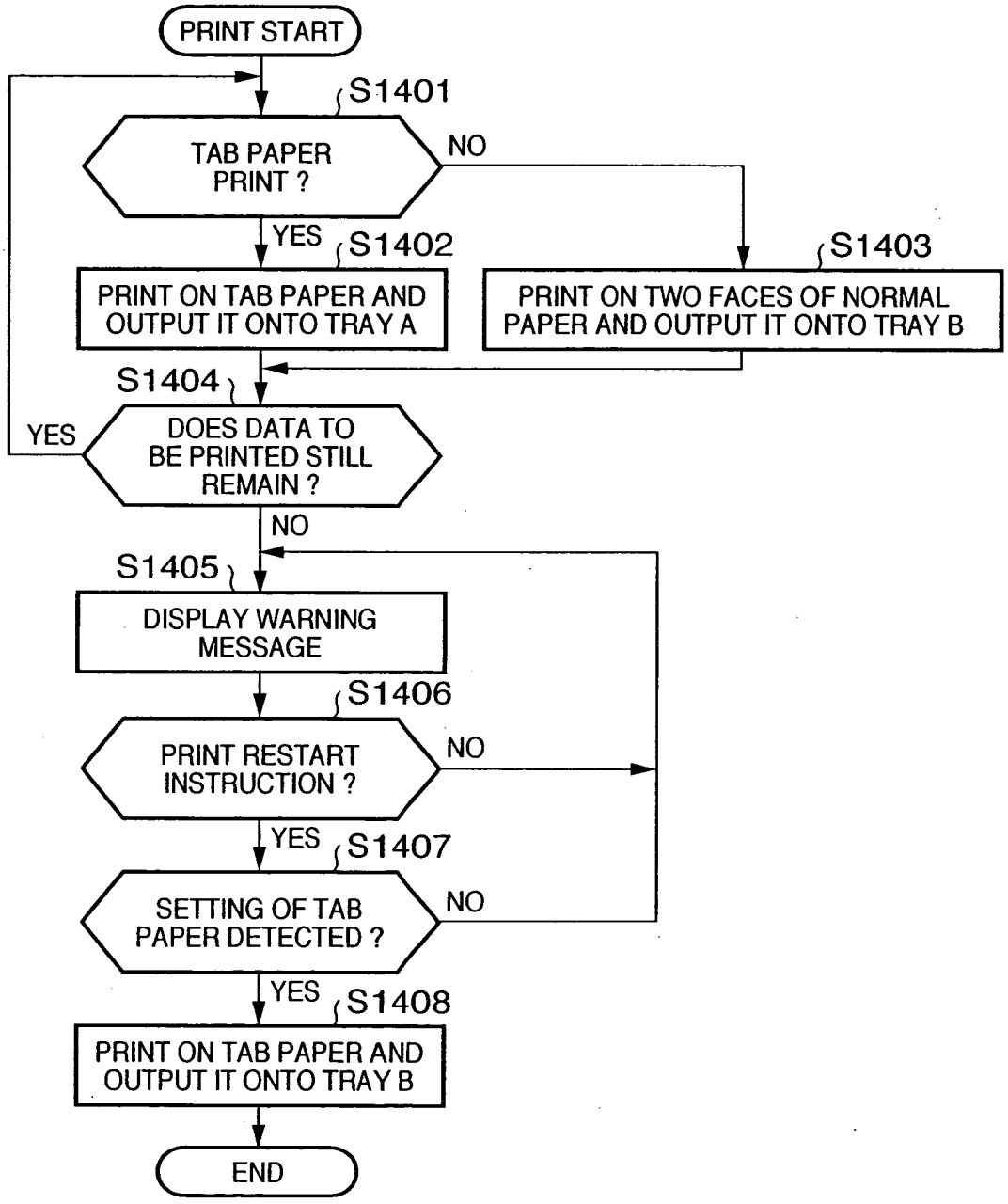

PRINT START
S1401
TAB PAPER PRINT ?
NO
YES
S1402
PRINT ON TAB PAPER AND OUTPUT IT ONTO TRAY A
S1403
PRINT ON TWO FACES OF NORMAL PAPER AND OUTPUT IT ONTO TRAY B
S1404
YES
DOES DATA TO BE PRINTED STILL REMAIN ?
NO
S1405
DISPLAY WARNING MESSAGE
S1406
PRINT RESTART INSTRUCTION ?
NO
YES
S1407
SETTING OF TAB PAPER DETECTED ?
NO
YES
S1408
PRINT ON TAB PAPER AND OUTPUT IT ONTO TRAY B
END

FIG. 15

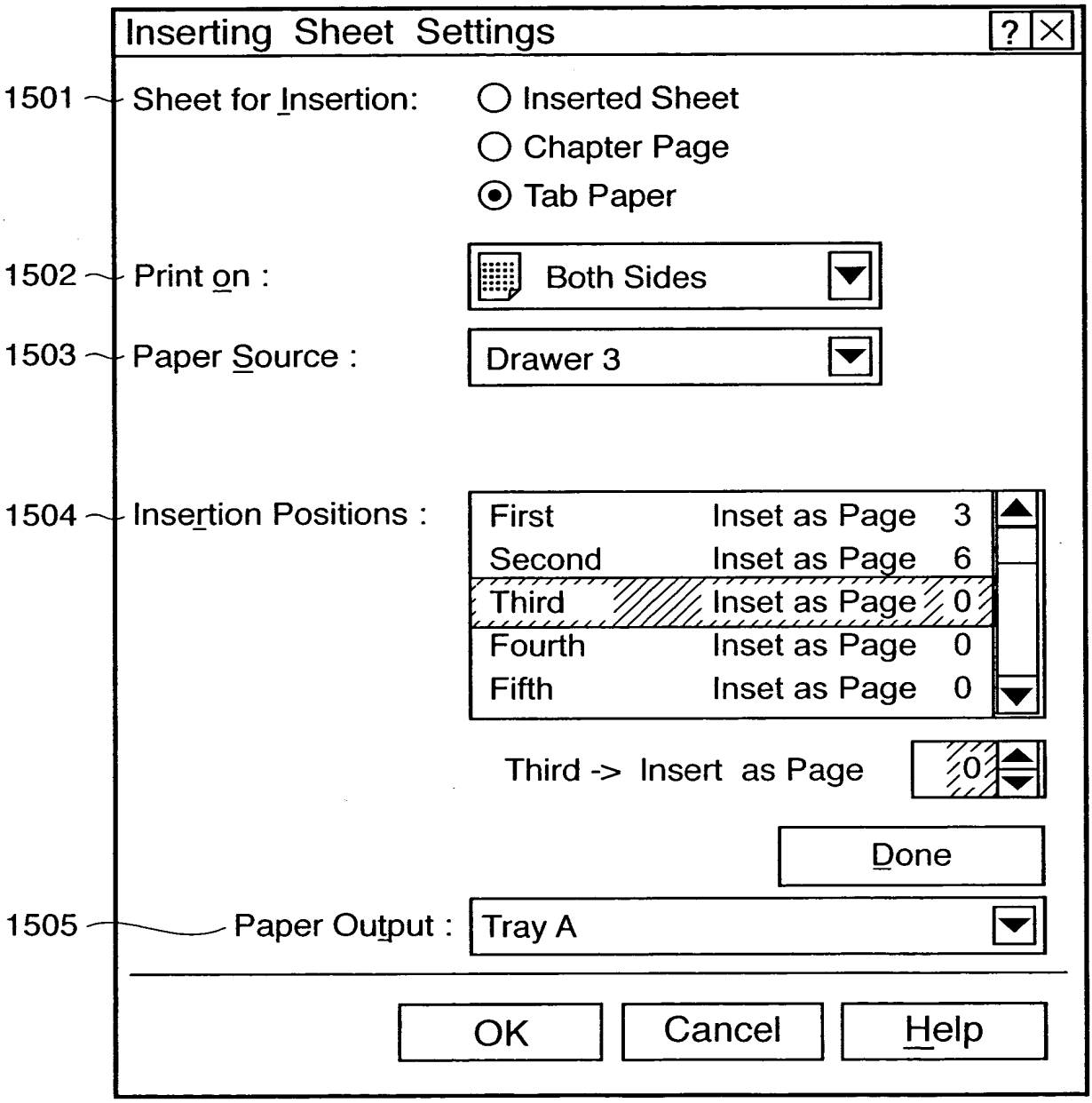

Inserting Sheet Settings
1501
Sheet for Insertion:
Inserted Sheet
Chapter Page
Tab Paper
1502
Print on :
Both Sides
1503
Paper Source :
Drawer 3
1504
Insertion Positions :
First Inset as Page 3
Second Inset as Page 6
Third Inset as Page 0
Fourth Inset as Page 0
Fifth Inset as Page 0
Third -> Insert as Page
0
Done
1505
Paper Output :
Tray A
OK
Cancel
Help

FIG. 16

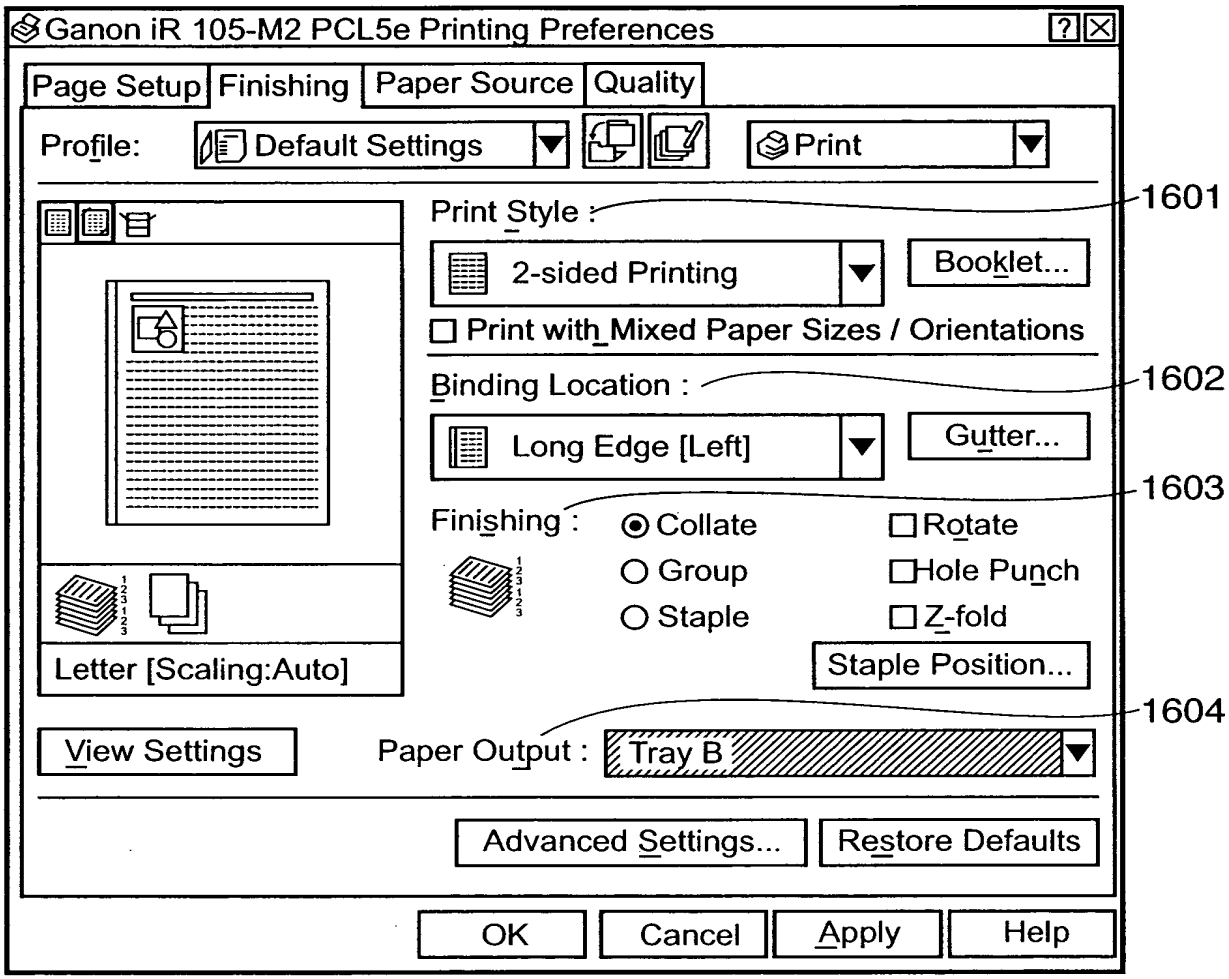

Ganon iR 105-M2 PCL5e Printing Preferences
Page Setup
Finishing
Paper Source
Quality
Profile:
Default Settings
Print
Print Style :
1601
2-sided Printing
Booklet...
Print with Mixed Paper Sizes / Orientations
Binding Location :
1602
Long Edge [Left]
Gutter...
Finishing :
1603
Collate
Group
Staple
Rotate
Hole Punch
Z-fold
Staple Position...
Letter [Scaling:Auto]
View Settings
Paper Output :
1604
Tray B
Advanced Settings...
Restore Defaults
OK
Cancel
Apply
Help

FIG. 17

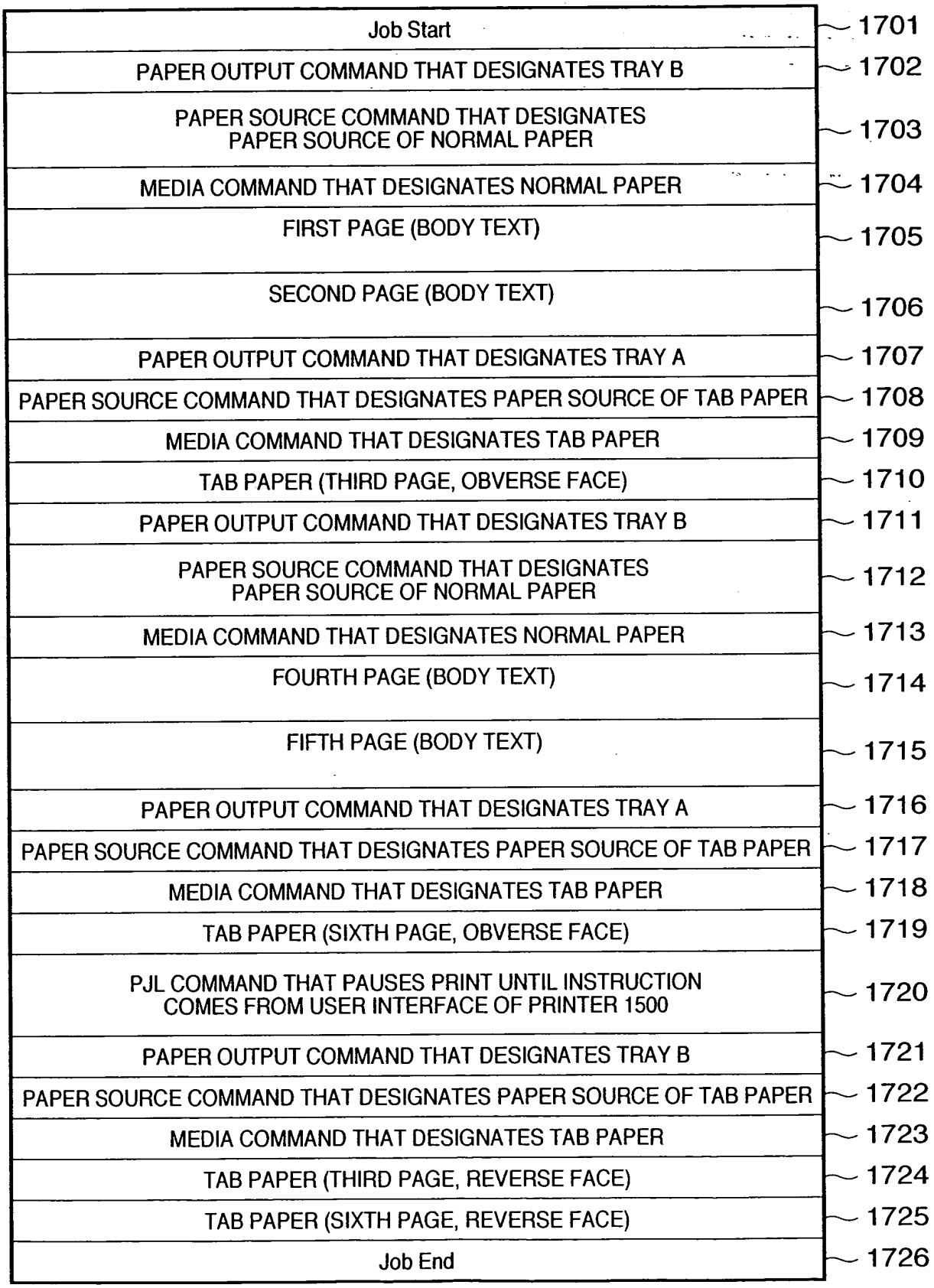

Job Start
1701
PAPER OUTPUT COMMAND THAT DESIGNATES TRAY B
1702
PAPER SOURCE COMMAND THAT DESIGNATES PAPER SOURCE OF NORMAL PAPER
1703
MEDIA COMMAND THAT DESIGNATES NORMAL PAPER
1704
FIRST PAGE (BODY TEXT)
1705
SECOND PAGE (BODY TEXT)
1706
PAPER OUTPUT COMMAND THAT DESIGNATES TRAY A
1707
PAPER SOURCE COMMAND THAT DESIGNATES PAPER SOURCE OF TAB PAPER
1708
MEDIA COMMAND THAT DESIGNATES TAB PAPER
1709
TAB PAPER (THIRD PAGE, OBVERSE FACE)
1710
PAPER OUTPUT COMMAND THAT DESIGNATES TRAY B
1711
PAPER SOURCE COMMAND THAT DESIGNATES PAPER SOURCE OF NORMAL PAPER
1712
MEDIA COMMAND THAT DESIGNATES NORMAL PAPER
1713
FOURTH PAGE (BODY TEXT)
1714
FIFTH PAGE (BODY TEXT)
1715
PAPER OUTPUT COMMAND THAT DESIGNATES TRAY A
1716
PAPER SOURCE COMMAND THAT DESIGNATES PAPER SOURCE OF TAB PAPER
1717
MEDIA COMMAND THAT DESIGNATES TAB PAPER
1718
TAB PAPER (SIXTH PAGE, OBVERSE FACE)
1719
PJL COMMAND THAT PAUSES PRINT UNTIL INSTRUCTION COMES FROM USER INTERFACE OF PRINTER 1500
1720
PAPER OUTPUT COMMAND THAT DESIGNATES TRAY B
1721
PAPER SOURCE COMMAND THAT DESIGNATES PAPER SOURCE OF TAB PAPER
1722
MEDIA COMMAND THAT DESIGNATES TAB PAPER
1723
TAB PAPER (THIRD PAGE, REVERSE FACE)
1724
TAB PAPER (SIXTH PAGE, REVERSE FACE)
1725
Job End
1726

FIG. 18

Job Start	1801
PAPER OUTPUT COMMAND THAT DESIGNATES TRAY B	1802
PAPER SOURCE COMMAND THAT DESIGNATES PAPER SOURCE OF NORMAL PAPER	1803
MEDIA COMMAND THAT DESIGNATES NORMAL PAPER	1804
FIRST PAGE (BODY TEXT)	1805
SECOND PAGE (BODY TEXT)	1806
THIRD PAGE (BODY TEXT)	1807
BLANK PAGE NON-BILLING COMMAND	1808
PAPER OUTPUT COMMAND THAT DESIGNATES TRAY A	1809
PAPER SOURCE COMMAND THAT DESIGNATES PAPER SOURCE OF TAB PAPER	1810
MEDIA COMMAND THAT DESIGNATES TAB PAPER	1811
TAB PAPER (FOURTH PAGE, OBVERSE FACE)	1812
PAPER OUTPUT COMMAND THAT DESIGNATES TRAY B	1813
PAPER SOURCE COMMAND THAT DESIGNATES PAPER SOURCE OF NORMAL PAPER	1814
MEDIA COMMAND THAT DESIGNATES NORMAL PAPER	1815
FIFTH PAGE (BODY TEXT)	1816
SIXTH PAGE (BODY TEXT)	1817
SEVENTH PAGE (BODY TEXT)	1818
BLANK PAGE NON-BILLING COMMAND	1819
PAPER OUTPUT COMMAND THAT DESIGNATES TRAY A	1820
PAPER SOURCE COMMAND THAT DESIGNATES PAPER SOURCE OF TAB PAPER	1821
MEDIA COMMAND THAT DESIGNATES TAB PAPER	1822
TAB PAPER (EIGHTH PAGE, OBVERSE FACE)	1823
PJL COMMAND THAT PAUSES PRINT UNTIL INSTRUCTION COMES FROM USER INTERFACE OF PRINTER 1500	1824
PAPER OUTPUT COMMAND THAT DESIGNATES TRAY B	1825
PAPER SOURCE COMMAND THAT DESIGNATES PAPER SOURCE OF TAB PAPER	1826
MEDIA COMMAND THAT DESIGNATES TAB PAPER	1827
TAB PAPER (FOURTH PAGE, REVERSE FACE)	1828
TAB PAPER (EIGHTH PAGE, REVERSE FACE)	1829
Job End	1830

FIG. 19

Job Start	1901
PAPER OUTPUT COMMAND THAT DESIGNATES TRAY B	1902
PAPER SOURCE COMMAND THAT DESIGNATES PAPER SOURCE OF NORMAL PAPER	1903
MEDIA COMMAND THAT DESIGNATES NORMAL PAPER	1904
2-SIDED PRINT COMMAND	1905
FIRST PAGE (BODY TEXT)	1906
SECOND PAGE (BODY TEXT)	1907
1-SIDED PRINT COMMAND	1908
THIRD PAGE (BODY TEXT)	1909
PAPER OUTPUT COMMAND THAT DESIGNATES TRAY A	1910
PAPER SOURCE COMMAND THAT DESIGNATES PAPER SOURCE OF TAB PAPER	1911
MEDIA COMMAND THAT DESIGNATES TAB PAPER	1912
TAB PAPER (FOURTH PAGE, OBVERSE FACE)	1913
PAPER OUTPUT COMMAND THAT DESIGNATES TRAY B	1914
PAPER SOURCE COMMAND THAT DESIGNATES PAPER SOURCE OF NORMAL PAPER	1915
MEDIA COMMAND THAT DESIGNATES NORMAL PAPER	1916
2-SIDED PRINT COMMAND	1917
FIFTH PAGE (BODY TEXT)	1918
SIXTH PAGE (BODY TEXT)	1919
1-SIDED PRINT COMMAND	1920
SEVENTH PAGE (BODY TEXT)	1921
PAPER OUTPUT COMMAND THAT DESIGNATES TRAY A	1922
PAPER SOURCE COMMAND THAT DESIGNATES PAPER SOURCE OF TAB PAPER	1923
MEDIA COMMAND THAT DESIGNATES TAB PAPER	1924
TAB PAPER (EIGHTH PAGE, OBVERSE FACE)	1925
PJL COMMAND THAT PAUSES PRINT UNTIL INSTRUCTION COMES FROM USER INTERFACE OF PRINTER 1500	1926
PAPER OUTPUT COMMAND THAT DESIGNATES TRAY B	1927
PAPER SOURCE COMMAND THAT DESIGNATES PAPER SOURCE OF TAB PAPER	1928
MEDIA COMMAND THAT DESIGNATES TAB PAPER	1929
TAB PAPER (FOURTH PAGE, REVERSE FACE)	1930
TAB PAPER (EIGHTH PAGE, REVERSE FACE)	1931
Job End	1932

FIG. 20

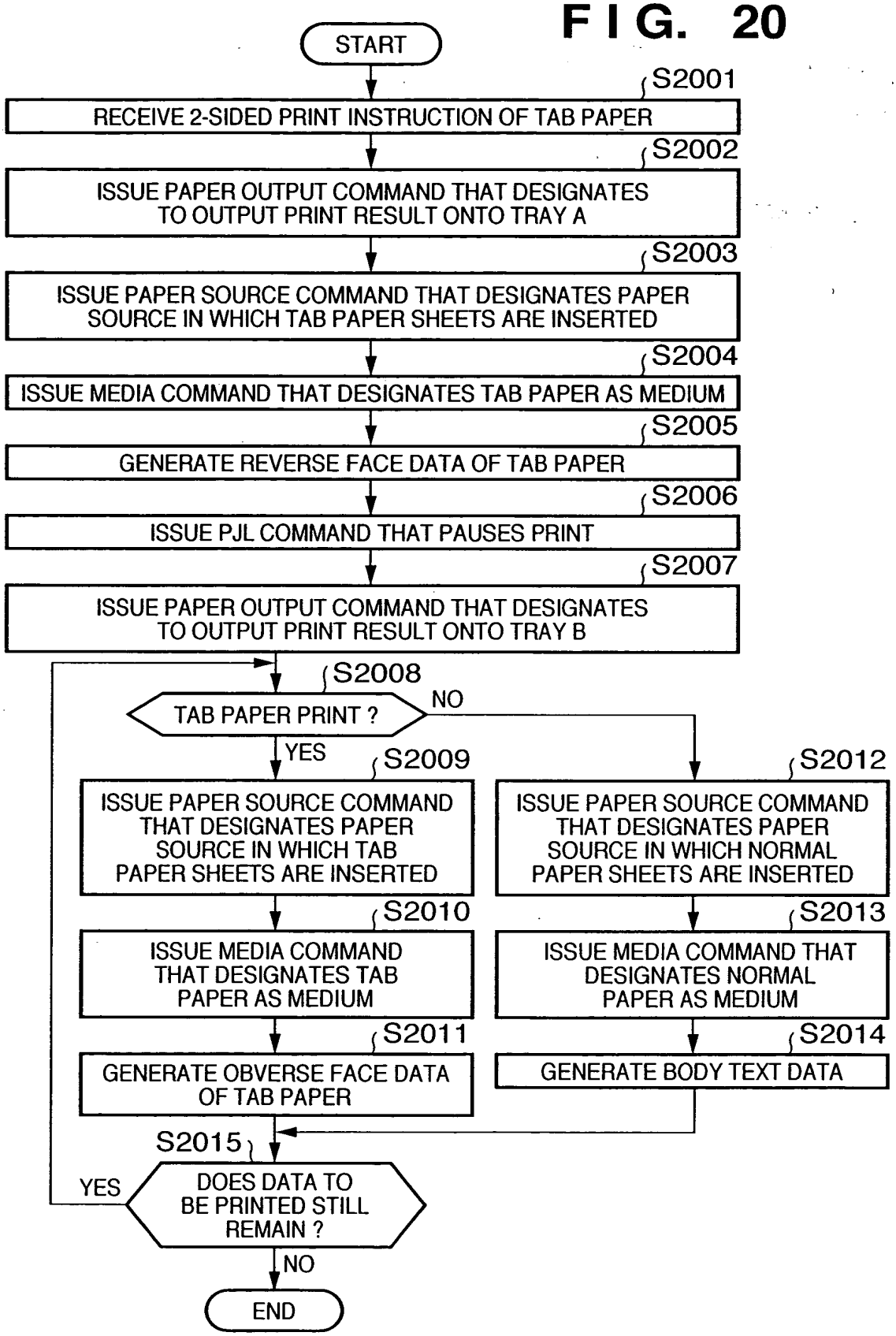

START
S2001
RECEIVE 2-SIDED PRINT INSTRUCTION OF TAB PAPER
S2002
ISSUE PAPER OUTPUT COMMAND THAT DESIGNATES TO OUTPUT PRINT RESULT ONTO TRAY A
S2003
ISSUE PAPER SOURCE COMMAND THAT DESIGNATES PAPER SOURCE IN WHICH TAB PAPER SHEETS ARE INSERTED
S2004
ISSUE MEDIA COMMAND THAT DESIGNATES TAB PAPER AS MEDIUM
S2005
GENERATE REVERSE FACE DATA OF TAB PAPER
S2006
ISSUE PJL COMMAND THAT PAUSES PRINT
S2007
ISSUE PAPER OUTPUT COMMAND THAT DESIGNATES TO OUTPUT PRINT RESULT ONTO TRAY B
S2008
TAB PAPER PRINT ?
NO
YES
S2009
ISSUE PAPER SOURCE COMMAND THAT DESIGNATES PAPER SOURCE IN WHICH TAB PAPER SHEETS ARE INSERTED
S2010
ISSUE MEDIA COMMAND THAT DESIGNATES TAB PAPER AS MEDIUM
S2011
GENERATE OBVERSE FACE DATA OF TAB PAPER
S2012
ISSUE PAPER SOURCE COMMAND THAT DESIGNATES PAPER SOURCE IN WHICH NORMAL PAPER SHEETS ARE INSERTED
S2013
ISSUE MEDIA COMMAND THAT DESIGNATES NORMAL PAPER AS MEDIUM
S2014
GENERATE BODY TEXT DATA
S2015
YES
DOES DATA TO BE PRINTED STILL REMAIN ?
NO
END

FIG. 21

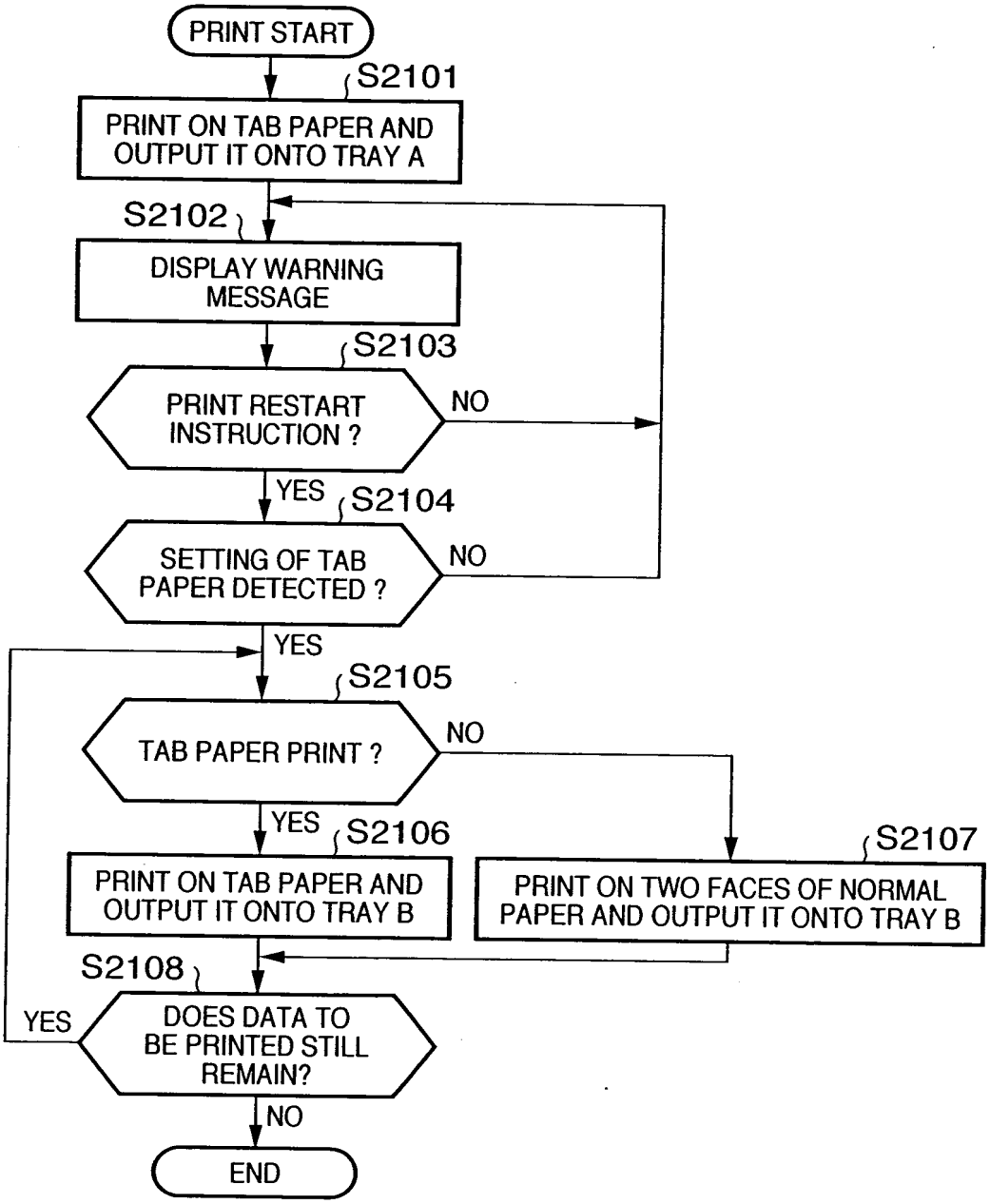

PRINT START
S2101
PRINT ON TAB PAPER AND OUTPUT IT ONTO TRAY A
S2102
DISPLAY WARNING MESSAGE
S2103
PRINT RESTART INSTRUCTION ?
NO
YES
S2104
SETTING OF TAB PAPER DETECTED ?
NO
YES
S2105
TAB PAPER PRINT ?
NO
YES
S2106
PRINT ON TAB PAPER AND OUTPUT IT ONTO TRAY B
S2107
PRINT ON TWO FACES OF NORMAL PAPER AND OUTPUT IT ONTO TRAY B
S2108
YES
DOES DATA TO BE PRINTED STILL REMAIN?
NO
END

FIG. 22

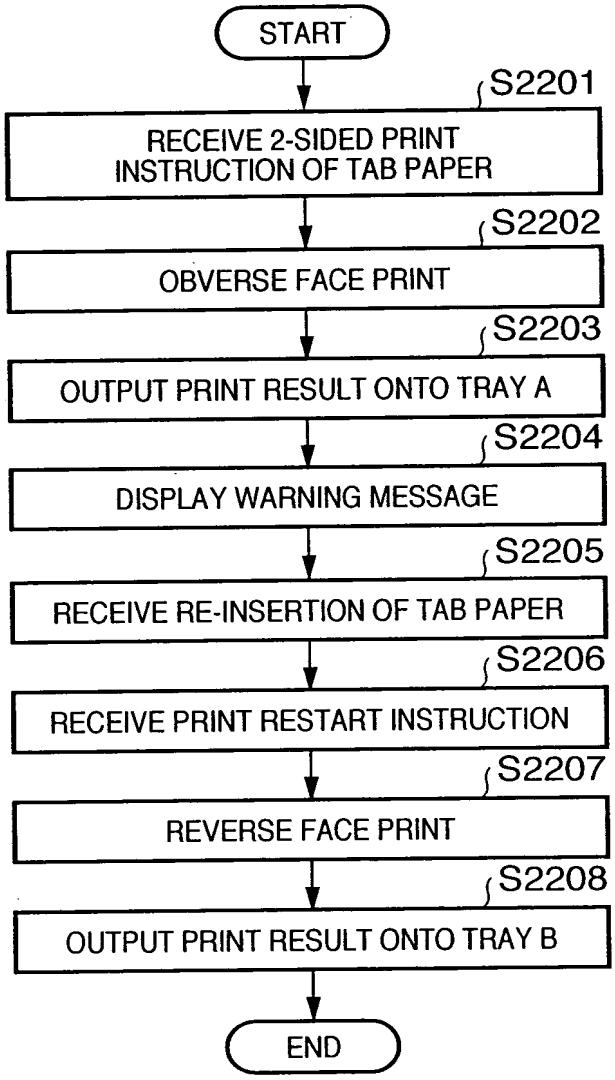

START
S2201
RECEIVE 2-SIDED PRINT INSTRUCTION OF TAB PAPER
S2202
OBVERSE FACE PRINT
S2203
OUTPUT PRINT RESULT ONTO TRAY A
S2204
DISPLAY WARNING MESSAGE
S2205
RECEIVE RE-INSERTION OF TAB PAPER
S2206
RECEIVE PRINT RESTART INSTRUCTION
S2207
REVERSE FACE PRINT
S2208
OUTPUT PRINT RESULT ONTO TRAY B
END

FIG. 23

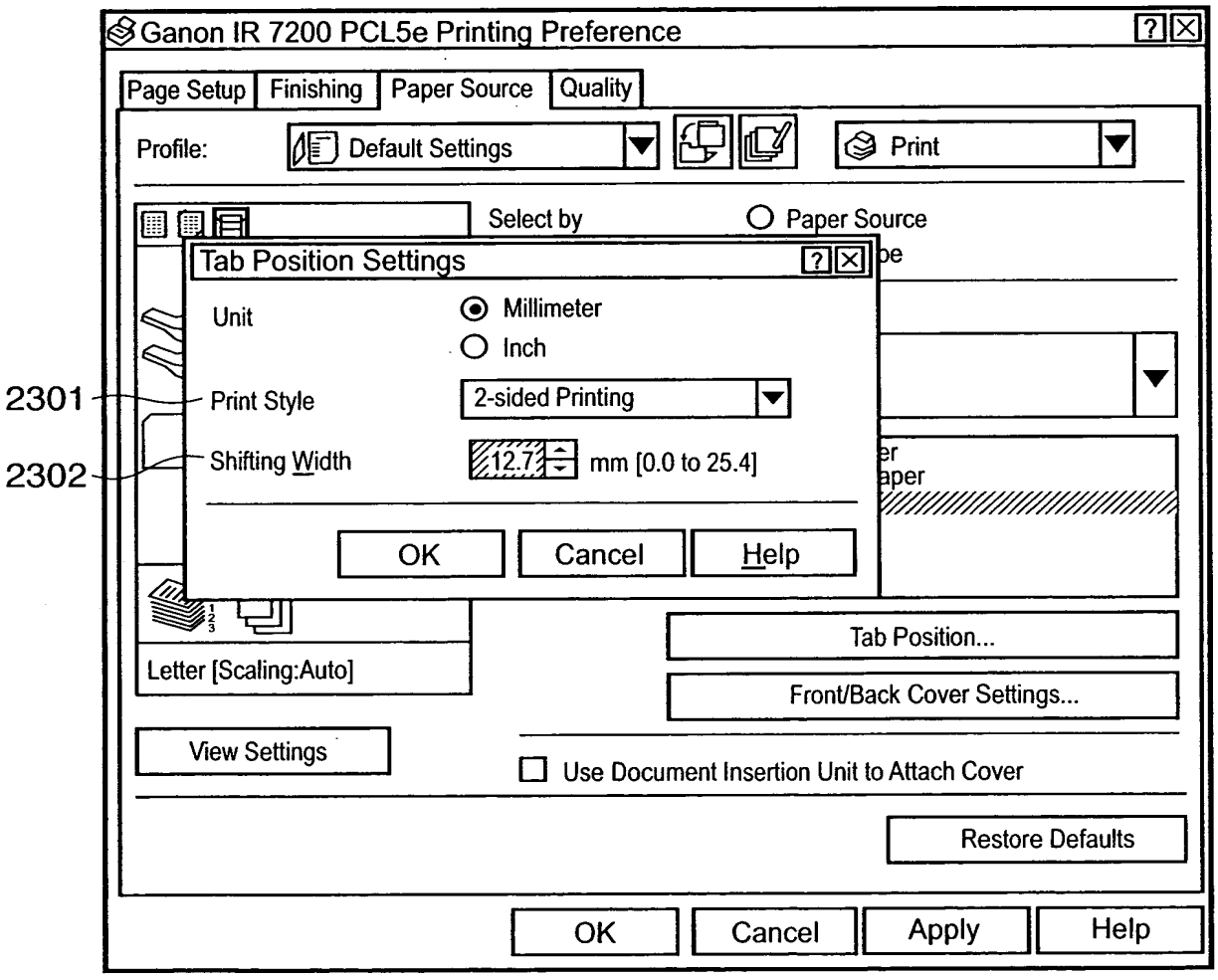
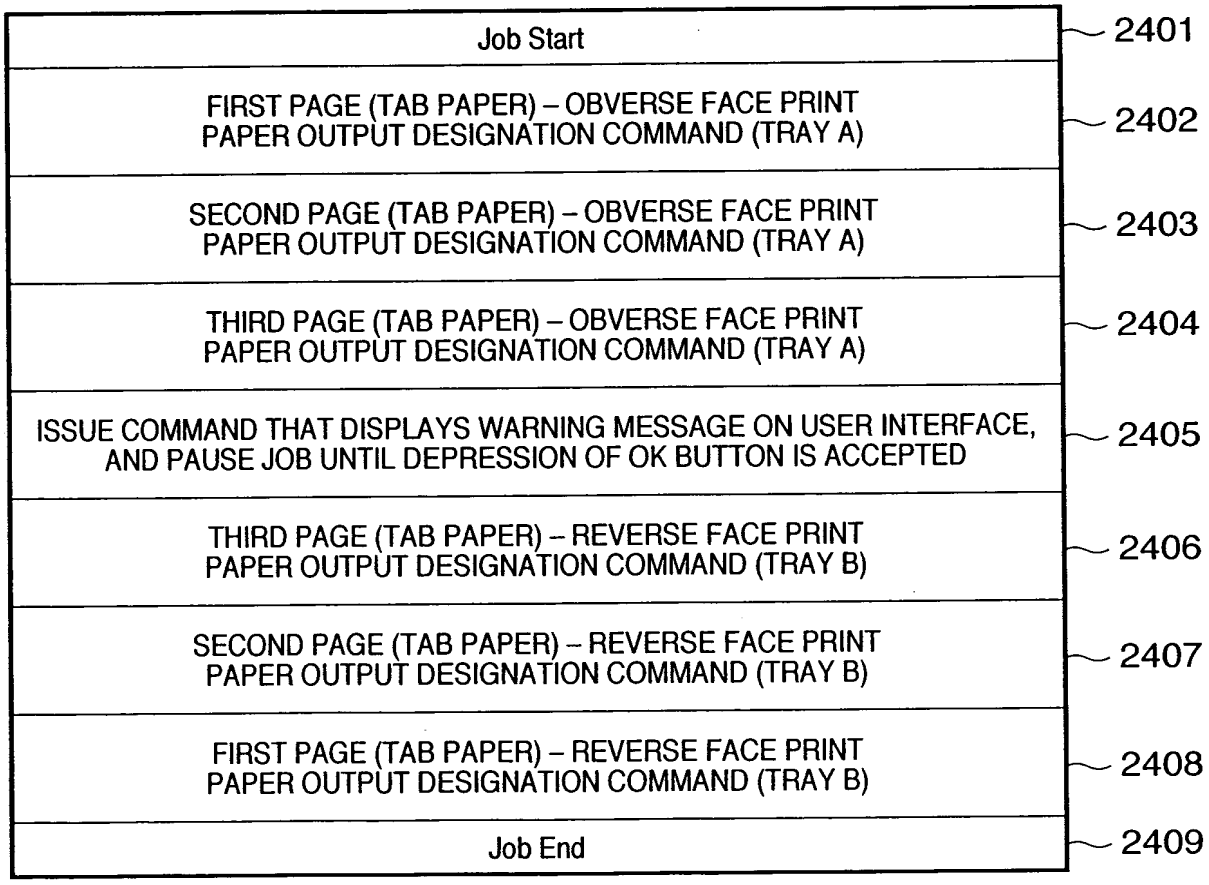

Ganon IR 7200 PCL5e Printing Preference
Page Setup
Finishing
Paper Source
Quality
Profile:
Default Settings
Print
Select by
Paper Source
Tab Position Settings
Unit
Millimeter
Inch
2301
Print Style
2-sided Printing
2302
Shifting Width
12.7
mm [0.0 to 25.4]
OK
Cancel
Help
Letter [Scaling:Auto]
Tab Position...
Front/Back Cover Settings...
View Settings
Use Document Insertion Unit to Attach Cover
Restore Defaults
OK
Cancel
Apply
Help

FIG. 24


Job Start
2401
FIRST PAGE (TAB PAPER) – OBVERSE FACE PRINT
PAPER OUTPUT DESIGNATION COMMAND (TRAY A)
2402
SECOND PAGE (TAB PAPER) – OBVERSE FACE PRINT
PAPER OUTPUT DESIGNATION COMMAND (TRAY A)
2403
THIRD PAGE (TAB PAPER) – OBVERSE FACE PRINT
PAPER OUTPUT DESIGNATION COMMAND (TRAY A)
2404
ISSUE COMMAND THAT DISPLAYS WARNING MESSAGE ON USER INTERFACE,
AND PAUSE JOB UNTIL DEPRESSION OF OK BUTTON IS ACCEPTED
2405
THIRD PAGE (TAB PAPER) – REVERSE FACE PRINT
PAPER OUTPUT DESIGNATION COMMAND (TRAY B)
2406
SECOND PAGE (TAB PAPER) – REVERSE FACE PRINT
PAPER OUTPUT DESIGNATION COMMAND (TRAY B)
2407
FIRST PAGE (TAB PAPER) – REVERSE FACE PRINT
PAPER OUTPUT DESIGNATION COMMAND (TRAY B)
2408
Job End
2409